

Amendments to the Claims:

Please amend the claims as follows:

1. Charged A charged particle emission component for providing a charged particle beam, comprising:  
~~a first ultra-high vacuum (UHV) region (102) wherein the first UHV region does not comprise elements, which essentially block a portion of the charged particle beam;~~  
a second UHV region (104); and  
~~a residual gas diffusion barrier (106; 206) separating the first and the second UHV regions.[:]] whereby the first ultra-high vacuum region does not comprise elements, which essentially block a portion of the charged particle beam; and wherein the first and the second UHV regions (102, 104) each have a vacuum flange (102a, 404a).~~
2. Charged The charged particle emission component according to claim 1, further comprising an emitter [[(16)]] in the first UHV region for emitting the beam-of charged particle beam [[(17)]].
3. Charged The charged particle emission component according to any-of-the preceding-claims claim 1, further comprising an aperture unit (110) for differential pumping between the emission component and a further chamber (112) of a charged particle beam column.
4. Charged The charged particle emission component according to any-of-the preceding-claims claim 1, whereby wherein the residual gas diffusion barrier has an opening (107) with a diameter larger than the diameter corresponding to the a beam emission angle; preferably with a diameter corresponding to a beam emission angle of minimal 10°.
5. Charged The charged particle emission component according to any-of-the preceding-claims claim 1, wherein the residual gas diffusion barrier (106; 206) has an opening (107) for the charged particle beam, the opening [[has]] having a size of at

least 1 mm, preferably of at least above 5mm.

6. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the residual gas diffusion barrier acts (106; 206) as an extraction electrode for extracting or modulating [[the]] emitted charged particles.

7. Charged The charged particle emission component according to any of the preceding claims claim 1, further comprising at least one beam shaping element (109; 18; 108; 402) in the second UHV region (104), wherein the at least one beam shaping element blocks a portion of the charged particle beam by having an opening for the charged particle beam, the opening [[has]] having a size corresponding to a beam emission angle of below less than 5°, preferably of below 1°.

8. Charged The charged particle emission component according to any of the preceding claims 7 claim 1, wherein the first and the second UHV regions have in operation a maximum pressure of maximal  $10^{-8}$  mbar.

9. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the first and the second UHV regions have in operation a maximum pressure difference of maximal one order of magnitude.

10. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the amount of charged particles impinging on surfaces located in the first UHV region is maximal maximally 20% of an amount of charged particles impinging on surfaces located in the emission component.

11. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the first vacuum flange (102a) corresponding to the first UHV region (102) and the second vacuum flange (104a) corresponding to the second UHV region (104) are connected to one vacuum pump (502).

12. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the first vacuum flange corresponding to the first UHV region and the second vacuum flange corresponding to the second UHV region

are connected to separate vacuum pumps (502a, 502b).

13. Charged The charged particle emission component according to any of the preceding claims claim 1, wherein the residual gas diffusion barrier is an isolating aperture and the first and the second UHV regions are UHV chambers.

14. Charged A charged particle emission component for providing a charged particle beam, comprising:

a housing (101) of the charged particle emission component;

an emitter [[(16)]] for emitting a beam of the charged particles particle beam [[(17)]] with a beam emission angle;

at least one beam shaping element (109; 18; 108; 402); and

a residual gas diffusion barrier (106; 206) directly subsequent to the emitter, whereby wherein the residual gas diffusion barrier separates the charged particle emission component into a first and a second [[UHV]] ultra-high vacuum (UHV) region, whereby wherein the residual gas diffusion barrier has an opening (107) with a diameter larger than the diameter corresponding to the beam emission angle[[.]], and wherein the first and the second UHV regions each have a vacuum flange (102a, 104a).

15. Charged The charged particle emission component according to claim 14, whereby wherein the first UHV region does not comprise elements, which essentially block a portion of the charged particle beam.

16. Charged The charged emission component according to any of the claims 14 to 45 claim 14, further comprising any of the features of claims 1 to 13 further comprising an aperture unit for differential pumping between the emission component and a further chamber of a charged particle beam column.

17. Charged The charged particle emission component according to any of claims 1 to 16 claim 1, wherein [[the]] surfaces of the first UHV region are the surfaces of at least the following components:

the emitter [[(16)]],

the residual gas diffusion barrier, and

[[the]] a part of the emission component housing (101) corresponding to the first UHV region, [[and]]

and wherein [[the]] surfaces of the second UHV region are the surfaces of at least the following components:

the at least one beam shaping element,

[[the]] a differential pumping aperture (109; 18; 108; 402), and

[[the]] a part of [[an]] the emission component housing corresponding to the second UHV region.

18. Charged A charged particle beam device making use of a charged particle emission component according to any of the preceding claims comprising a charged particle emission component, the emission component comprising:

a first ultra-high vacuum (UHV) region wherein the first UHV region does not comprise elements which essentially block a portion of the charged particle beam;

a second UHV region; and

a residual gas diffusion barrier separating the first and the second UHV regions, wherein the first and the second UHV regions each have a vacuum flange.

19. Method A method of operating a charged particle beam device, comprising the steps of:

evacuating a first [[UHV]] ultra-high vacuum (UHV) region to a maximum pressure of maximal  $10^{-8}$  mbar;

evacuating a second UHV region to a maximum pressure of maximal  $10^{-8}$  mbar;

evacuating at least a further chamber to a maximum pressure of maximal  $10^{-5}$  mbar; and

emitting a charged particle beam such that a portion of the charged particle beam is essentially not blocked within the first UHV region.

20. The method of operating a charged particle beam device according to claim 19, whereby wherein:

the charged particles are particle beam is emitted with an emission angle such that the amount of charged particles impinging on surfaces located in the first UHV

region is maximal maximally 20 % of the amount of charged particles impinging on surfaces located in the first and the second UHV regions.

21. Method The method of operating a charged particle beam device according to any of claims 19 to 20, whereby claim 19, wherein a portion of the beam is blocked in the second UHV region, such that the beam is shaped.